

# THE MINERAL INDUSTRY OF JORDAN

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Jordan was the world's fifth leading world producer of phosphate rock and the sixth leading producer of potash. It also produced such industrial minerals as bromine, feldspar, gypsum, kaolin, salt, and silica sand and such building materials as cement, dimension stone, limestone, and marble. Natural gas and petroleum products have been produced for domestic consumption. Deposits of copper, gold, iron, sulfur, and titanium were found in Jordan (Jasinski, 2005; Searls, 2005).

In 2004, Jordan's gross domestic product (GDP) amounted to about \$24.7 billion at purchasing power parity. Per capita GDP at purchasing power parity was about \$4,400. Jordan's GDP grew by 6.7% in 2004 compared with a revised 3.3% in 2003. In 2004, the output of the manufacturing sector amounted to 20% of the GDP; construction, 5.5%; electricity and water, 3%; and mining and quarrying, 3% (Central Bank of Jordan, 2005, p. 83; International Monetary Fund, 2005, p. 210; 2005<sup>1</sup>).

In 2004, total exports were valued at \$3.26 billion, of which potash accounted for \$231 million; fertilizers, \$175 million; phosphate rock, \$166 million; phosphoric acid, \$90.5 million; and cement, \$30 million. Minerals and associated processed products accounted for 21% of total exports. Total imports were valued at \$8.19 billion, of which crude petroleum accounted for \$1.08 billion; iron and steel, \$356 million; and refined petroleum products, \$292 million (Central Bank of Jordan, 2005, p. 64-67).

Jordan Bromine Company [a joint venture of Arab Potash Company Ltd. (APC) and Albemarle Corp. of the United States] produced bromine, calcium bromide, and sodium bromide at its plant at al-Safi on the Dead Sea. In 2004, bromine production amounted to 46,000 metric tons (t). In December, the company completed construction of its chlorine plant at al-Safi; this facility had a capacity of 25,000 metric tons per year (t/yr) (Albemarle Corp., 2005, p. 16).

In January 2004, Jordan Magnesia Company (a subsidiary of APC) started producing magnesia at al-Safi. The company's plant had capacities of 50,000 t/yr of refractory-grade magnesia and 10,000 t/yr of magnesium hydroxide and other magnesium compounds. By June, the plant was producing at 65% of capacity; production for the year was 22,000 t (Allaf, 2004; O'Driscoll, 2005).

The Jordan Phosphate Mines Company (JPMC) produced phosphate rock at the al-Abiad, the al-Hasa, and the Shidiya Mines. Phosphate rock production fell to 6.22 million metric tons (Mt) in 2004 from 6.76 Mt in 2003. JPMC planned to produce 8.5 Mt in 2010. In 2003, the discovery of 17 Mt of additional reserves increased the life of the al-Abiad and the al-Hasa Mines from 2007 to at least 2017 (Jordan Times, 2003).

Indo-Jordan Chemicals Company and Jordan Fertilizer Industry Company (JFIC) produced phosphoric acid. JFIC and Nippon Jordan Fertilizer Company (NJFC) also produced fertilizers at Aqaba.

APC's potash production fell to 1.93 Mt in 2004 from 1.96 Mt in 2003. In December 2004, APC announced plans to expand capacity to 2.45 million metric tons per year (Mt/yr) from about 1.9 Mt/yr. The expansion was expected to be completed in late 2007 or 2008. APC was also evaluating a future expansion to 3 Mt/yr (Arab Potash Company Ltd., 2004).

Kemira Arab Potash Company (a joint venture of APC and Kemira AG) started commercial production of potassium nitrate fertilizer and dicalcium phosphate animal feed supplement in 2003. Production was below capacity because of technical problems (Allaf, 2004).

Middle East Regional Development Enterprises planned to start commercial production of fracturing sand, silica flour, and silica sand at its processing plant in the first quarter of 2005. The plant, which was located at Ras al-Naqab, had a capacity of 530,000 t/yr; total resources at the adjacent mine were estimated to be 400 Mt (Industrial Minerals, 2005).

Production of natural gas increased at the Risha gasfield by about 2% in 2004. Reserves amounted to 6 billion cubic meters. Jordan imported natural gas from Egypt through the Arab Gasline at a rate of about 1 billion cubic meters per year. Imports were expected to rise to 2 billion cubic meters per year by 2008 (Clark, 2004).

## Outlook

Jordan's economy was expected to grow by 5% in 2005 and 5.5% in 2006 (International Monetary Fund, 2005, p. 210). The strength of the domestic economy could lead to higher demand for cement, dimension stone, sand and gravel, and steel. The outlook for bromine, magnesia, phosphate rock, and potash depended heavily upon world market conditions.

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<sup>1</sup>A reference that includes a section mark (§) is found in the Internet Reference Cited section.

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TABLE 1  
JORDAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity	2000	2001	2002	2003	2004
Bromine	--	--	-- <sup>r</sup>	-- <sup>r</sup>	46,000 <sup>p</sup>
Cement, hydraulic      thousand metric tons	2,640	3,173	3,558	3,515	3,908
Clay:					
Common clay	199,468	300,000 <sup>r,e</sup>	400,000 <sup>r,e</sup>	492,583 <sup>r</sup>	608,390
Kaolin	36,795	24,124 <sup>r</sup>	100,000 <sup>r,e</sup>	179,153 <sup>r</sup>	216,566
Zeolite tuff	9,797	7,500 <sup>r,e</sup>	5,000 <sup>r,e</sup>	2,710 <sup>r</sup>	2,790
Feldspar	11,112	611	530	13,057 <sup>r</sup>	13,060
Gypsum	157,868	86,012	11,252	63,895 <sup>r</sup>	135,331
Lime <sup>e</sup>	4,100	6,000 <sup>r</sup>	8,000 <sup>r</sup>	10,108 <sup>r,2</sup>	7,154 <sup>2</sup>
Magnesia	--	--	--	--	22,000 <sup>p</sup>
Natural gas, dry      million cubic meters	289 <sup>r</sup>	278 <sup>r</sup>	255 <sup>r</sup>	288 <sup>r</sup>	294
Petroleum:					
Crude      42-gallon barrels	13,200 <sup>r</sup>	11,800 <sup>r</sup>	11,000 <sup>r</sup>	9,839 <sup>r</sup>	8,480
Refinery products:					
Liquefied petroleum gas      thousand 42-gallon barrels	1,684	1,606	1,577	1,485 <sup>r</sup>	1,600 <sup>e</sup>
Gasoline      do.	4,957	5,465	5,383	5,084 <sup>r</sup>	5,400 <sup>e</sup>
Jet fuel      do.	1,950	1,693	1,650	2,109 <sup>r</sup>	2,200 <sup>e</sup>
Kerosene      do.	1,991	1,398	1,608	1,484 <sup>r</sup>	1,600 <sup>e</sup>
Distillate fuel oil      do.	6,662	7,456	8,139	8,579 <sup>r</sup>	9,100 <sup>e</sup>
Residual fuel oil      do.	8,929	8,564	7,911	7,759 <sup>r</sup>	8,300 <sup>e</sup>
Asphalt      do.	688	821	1,066	1,200 <sup>r</sup>	1,300 <sup>e</sup>
Total      do.	26,861	27,003	27,334	27,700 <sup>r</sup>	29,500 <sup>e</sup>
Phosphate:					
Phosphate rock, mine output:					
Gross weight      thousand metric tons	5,526	5,843	7,179	6,762 <sup>r</sup>	6,223
P <sub>2</sub> O <sub>5</sub> content      do.	1,824	1,928	2,340	2,230	2,050
P <sub>2</sub> O <sub>5</sub> equivalent:					
Diammonium phosphate	197,000	256,000	267,000	210,000	293,000
Phosphoric acid	543,000	482,000	594,000	563,000	566,000
Potash:					
Crude salts      thousand metric tons	1,936	1,963	1,956	1,961	1,929
K <sub>2</sub> O equivalent      do.	1,162	1,180	1,170	1,230	1,210
Salt	311,189	329,000	406,652 <sup>r</sup>	11,976 <sup>r</sup>	28,700 <sup>p</sup>
Sand:					
Silica	118,045	90,000 <sup>r,e</sup>	60,000 <sup>r,e</sup>	33,100 <sup>r</sup>	46,000
Other      thousand metric tons	NA	NA	NA	8,349	17,320 <sup>p</sup>
Steel:					
Crude <sup>e</sup>	30,000	30,000	134,000 <sup>r,2</sup>	135,000 <sup>r</sup>	135,000
Semimanufactured <sup>e</sup>	270,000 <sup>2</sup>	290,000	290,000	290,000	290,000
Stone:					
Dimension, worked      thousand meters	3,508	7,000 <sup>r,e</sup>	10,000 <sup>r,e</sup>	13,578 <sup>r</sup>	6,560 <sup>p</sup>
Gravel and crushed rock      thousand cubic meters	10,381	11,000 <sup>e</sup>	13,000 <sup>r,e</sup>	14,266 <sup>r</sup>	14,900 <sup>p</sup>
Limestone <sup>e</sup> do.	8,000	8,400	9,600	9,500	9,500
Marble      cubic meters	21,575	21,000 <sup>r,e</sup>	21,000 <sup>r,e</sup>	20,685 <sup>r</sup>	27,650 <sup>p</sup>
Sulfuric acid:					
Gross weight      thousand metric tons	1,760 <sup>r</sup>	1,650 <sup>r</sup>	1,800 <sup>r</sup>	1,650 <sup>r</sup>	1,790
S content      do.	575 <sup>r</sup>	539 <sup>r</sup>	588 <sup>r</sup>	539	585

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through September 12, 2005.

<sup>2</sup>Reported figure.

TABLE 2  
JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2004

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies	Location of main facilities	Annual capacity
Bromine		Jordan Bromine Company (Arab Potash Company Ltd., 50%, and Kemira Danmark A/S, 50%)	al-Safi	50.
Cement		Jordan Cement Factories Co. Ltd. (LaFarge Group, 44%; Jordan Investment Corp., 14.3%; Social Security Corp., 9%)	Fuhia and Rashadia	4,100.
Do.		Arab Company for White Cement Industry	Amman	130.
Magnesia		Jordan Magnesia Company (Arab Potash Company Ltd., 55.8%)	al-Safi	60.
Natural gas	million cubic meters	National Petroleum Company (Government, 100%)	Risha	460.
Petroleum:				
Crude	thousand 42-gallon barrels	National Petroleum Company	Hamza	NA.
Refined	do.	Jordan Petroleum Refinery Company	Zarqa	33,000.
Phosphate:				
Phosphate rock		Jordan Phosphate Mines Company (Jordan Investment Corp., 41.5%; Social Security Corp., 27.8%; Kuwait Investment Corp., 15.9%)	al-Hasa	4,000.
Do.		do.	Shidiya	3,264.
Do.		do.	al-Abiad	3,000.
Phosphatic fertilizers		Jordan Fertilizer Industry Company (Government, 26%, and Jordan Phosphate Mines Company, 25%)	Aqaba	600 DAP. <sup>1</sup>
Do.		Nippon Jordan Fertilizer Company (Arab Potash Company Ltd., 20% and Jordan Phosphate Mines Company, 20%,)	Shiyada	100 DAP; 200 other.
Do.		Kemira Arab Potash Company (Arab Potash Company Ltd., 50%, and Kemira Danmark A/S, 50%)	Aqaba	75.
Phosphoric acid <sup>2</sup>		Jordan Fertilizer Industry Company	do.	750.
Do. <sup>2</sup>		Indo-Jordan Chemicals Company (Southern Petrochemical Industries Corp., 52.2%; Jordan Phosphate Mines Company 34.8%; Arab Investment Co., 13%)	Shiyada	224.
Potash		Arab Potash Company Ltd. (Government of Jordan, 52.9%; Arab Mining Co., 20.7%; Islamic Development Bank, 5.2%)	al-Safi	1,900.
Potassium nitrate		Kemira Arab Potash Company	Aqaba	150.
Salt		Jordan Safi Salt Company (subsidiary of Arab Potash Company Ltd.)	al-Safi	1,232.
Do.		al-Azraq	Azraq	NA.
Sand, silica		Middle Eastern Regional Development Enterprises	Ras al-Naqab	530.
Steel:				
Crude		Jordan Steel plc	Amman	250.
Semimanufactured		do.	do.	250.
Do.		National Steel Industry Co.	Awajan	100.
Do.		Other steel producers	NA	506.
Sulfuric acid		Jordan Fertilizer Industry Company	Aqaba	1,640.
Do.		Indo-Jordan Chemicals Company	Shiyada	660.

NA Not available.

<sup>1</sup>Diammonium phosphate.

<sup>2</sup>Expressed in phosphorus pentoxide (P<sub>2</sub>O<sub>5</sub>) equivalent.